Pre-Calculus Name_____ ID: 1

Summer Assignment Part 0

Date_____

Find the value of x or y so that the line through the points has the given slope.

1) $(x, 8)$ and $(-3, -2)$; slope: $-\frac{10}{3}$

2) $(-1, 5)$ and $(-9, y)$; slope: $-\frac{1}{4}$

3) $(x, 3)$ and $(2, 0)$; slope: $\frac{3}{5}$

4) $(-4, 8)$ and $(0, y)$; slope: $-\frac{5}{4}$

5) $\left(-2\frac{3}{8}, \frac{2}{3}\right)$ and $\left(x, -\frac{5}{6}\right)$; slope: $-\frac{3}{10}$

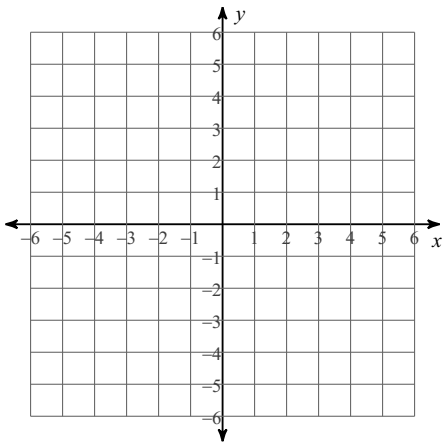
6) $(0, y)$ and $\left(\frac{3}{4}, -\frac{14}{9}\right)$; slope: 0

7) $\left(x, \frac{3}{2}\right)$ and $\left(\frac{1}{8}, -3\frac{1}{3}\right)$; slope: $\frac{116}{9}$

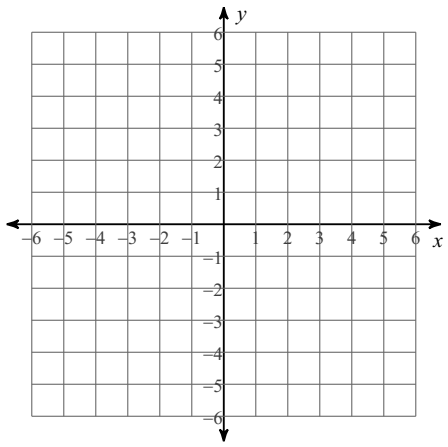
8) $\left(x, -\frac{3}{2}\right)$ and $\left(\frac{1}{2}, \frac{5}{4}\right)$; slope: $-\frac{33}{10}$

Sketch the graph of each line.

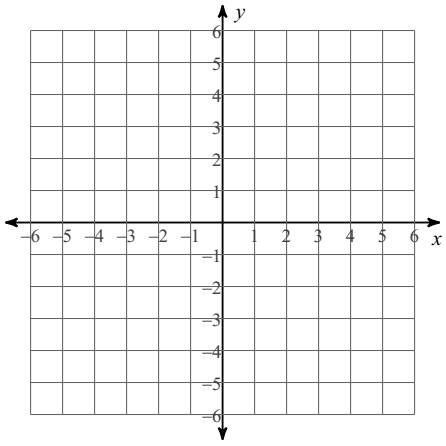
9) $3x - y = -4$



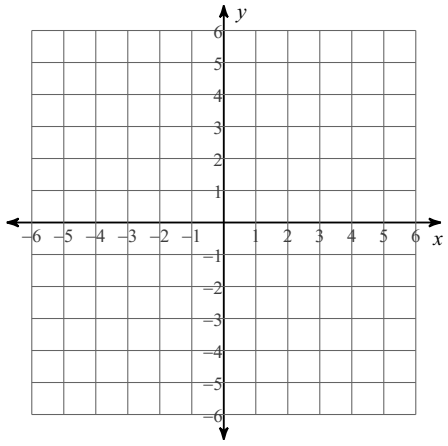
10) $x + 4y = -16$



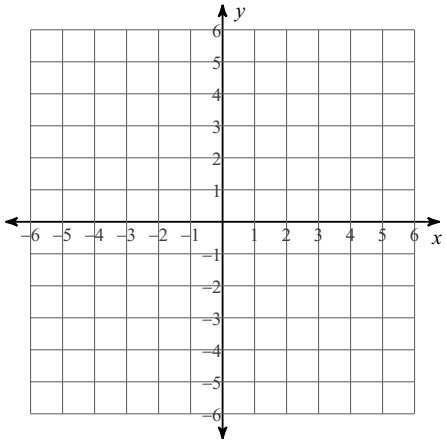
11) $y = \frac{1}{2}x + 4$



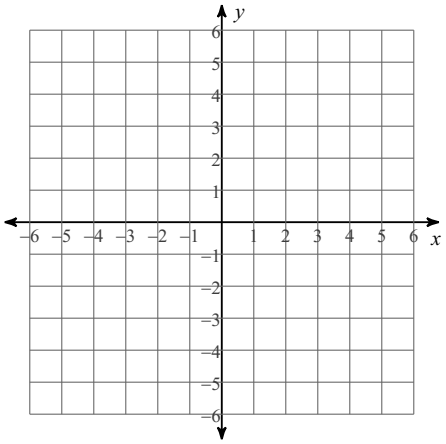
12) $y = -\frac{3}{2}x - 2$



13) $0 = 1 - \frac{1}{2}y - \frac{7}{4}x$



14) $-3 + 4x = -y$



Write the point-slope form of the equation of each line given the slope and y-intercept.

15) Slope = 3, y-intercept = –4

16) Slope = $-\frac{7}{5}$, y-intercept = 2

Write the point-slope form of the equation of the line through the given point with the given slope.

17) through: $(4, 0)$, slope = $\frac{1}{4}$

18) through: $(-2, -1)$, slope = 2

Write the point-slope form of the equation of the line through the given points.

19) through: $(-3, -1)$ and $(2, 3)$

20) through: $(3, 4)$ and $(-1, -2)$

Write the point-slope form of the equation of the line described.

21) through: $(-2, -5)$, parallel to $y = -\frac{3}{2}x - 2$

22) through: $(-2, -2)$, parallel to $y = 2x$

23) through: $(2, 4)$, perp. to $y = -\frac{2}{3}x + 1$

24) through: $(0, -1)$, perp. to $y = -x + 2$

Please complete ALL work on a separate sheet of paper and ALWAYS show ALL work to support your answer!!

Part 1: Prerequisite Skills – Exponent Rules, The Quadratic Formula Factoring and Solving Polynomials

Simplify using exponent rules. Assume that no variable equals zero. Write all exponents as POSITIVE.

1. $\dfrac{x^{-2}y}{x^4y^{-1}}$
2. $\dfrac{12m^8y^6}{-9my^4}$
3. $\left(4a^3c^2\right)^3\left(-3ac^4\right)^2$
4. $\left(\dfrac{5a^7}{2b^5c}\right)^3$
5. $\left(\dfrac{7m^{-1}n^3}{m^{-1}n^2}\right)^{-1}$
6. $\dfrac{\left(3x^{-2}y^3\right)\left(5xy^{-8}\right)}{\left(x^3\right)^4\cdot y^{-2}}$

Solve each equation using the quadratic formula.

1. $2x^2-5x+3=0$
2. $2x^2-x-13=2$
3. $2x^2-x-4=2$
4. $8x^2-4x=18$
5. $10x^2+9=x$
6. $x^2=9x-20$
7. $9x^2-11=6x$
8. $4x^2-8=x$

Solve each equation by factoring.

9. $(3n-2)(4n+1)=0$
10. $m^2-3m=0$
11. $(5n-1)(n+1)=0$
12. $(n+2)(2n+5)=0$
13. $3k^2+72=33k$
14. $n^2=-18-9n$
15. $7v^2-42=-35v$
16. $k^2=-4k-4$
17. $-2v^2-v+12=-3v^2+6v$

Solve each polynomial.

18. $f(x)=x^4-4x^3+9x^2-20x+20$
19. $f(x)=4x^4+13x^2+9$
20. $f(x)=x^4+6x^3+11x^2+12x+18$
21. $f(x)=2x^3-7x^2-10x+35$
22. $f(x)=3x^4+5x^3+25x^2+45x-18$
23. $f(x)=x^4-1$
24. $f(x)=x^4+3x^3-19x^2+27x-252$

Part 2: Domain, Functions and Inverses

Find the domain of each function.

1. $h(x)=4x-3$
2. $g(x)=18-5x$
3. $f(x)=\dfrac{2x}{x-3}$
4. $f(x)=\dfrac{x+5}{x+4}$
5. $g(x)=\dfrac{x+3}{x(x+2)}$
6. $h(x)=\dfrac{x-2}{x^2-16x+60}$
7. $g(x)=\dfrac{4}{x^2-4}$
8. $f(x)=\sqrt{x-2}$
9. $h(x)=\dfrac{3x}{\sqrt{x-5}}$
10. $f(x)=\dfrac{5}{|x+3|}$
11. $g(x)=\dfrac{x+1}{x^2+4x}$
12. $h(x)=\dfrac{x+2}{\sqrt{9-x^2}}$
13. $j(x)=\dfrac{x}{|x-10|}$
14. $f(x)=\dfrac{\sqrt{8-x}}{x}$

Find $(f+g)(x)$, $(f-g)(x)$, $(f\cdot g)(x)$, and $\left(\dfrac{f}{g}\right)(x)$, given the following:

15. $f(x)=\dfrac{1}{x},\ g(x)=7-x$
16. $f(x)=\dfrac{1}{2-3x},\ g(x)=\dfrac{2}{3x-2}$
17. $f(x)=\dfrac{3x+5}{2},\ g(x)=\dfrac{2x-5}{3}$

Find $[f\circ g](x)$ for each $f(x)$ and $g(x)$. Also state the domain of the composition.

18. $f(x)=x^2$ and $g(x)=\dfrac{1}{x^3}$
19. $f(x)=\dfrac{x}{x-2}$ and $g(x)=\dfrac{3}{x}$
20. $f(x)=\dfrac{x-1}{x-2}$ and $g(x)=\dfrac{x-3}{x-4}$
21. $f(x)=x^2-16$ and $g(x)=\sqrt{x}$

Inverses: Find the inverse of each function.

22. $f(x)=x^3$
23. $h(x)=\dfrac{1}{x}$
24. $w(x)=2x+1$
25. $g(x)=x^2+1$, for $x\geq 0$
26. $r(x)=\sqrt[5]{2x+1}$

Showing Inverses by Composition: For each problem, find *f(g(x))* and *g(f(x))*. Then determine whether *f* and *g* are inverses.

27. $f(x)=x^2,\quad g(x)=\sqrt{x}$
28. $f(x)=x^3,\quad g(x)=\sqrt[3]{x}$
29. $f(x)=\dfrac{1}{x}+2,\quad g(x)=\dfrac{1}{x-2}$
30. $f(x)=2x+1,\quad g(x)=\dfrac{x}{2}-1$

Part 3: Logarithmic Functions

Evaluate each expression. Work on a separate sheet of paper. Make sure to show the exponential equation. Leave your answer in simplest fraction form, if necessary.

1. $\log_5 1$
2. $\log_4 \frac{1}{16}$
3. $\log_{\frac{1}{25}} 5$
4. $\log_9 27$
5. $\log_4 128$
6. $\log_{27} \frac{1}{3}$

Solve each equation. Work on a separate sheet of paper. Show all work. Leave your answer in simplest fraction form, if necessary.

7. $\log_9 x = \frac{3}{2}$
8. $\log_4 x = -\frac{3}{2}$
9. $\log_{10} x^2 = -4$
10. $\log_3(x+2) = 5$
11. $\log_6(2x-1) = 3$
12. $\log_4(2x) = -\frac{1}{2}$
13. $\log_8(x-5) = \frac{2}{3}$

Solve each equation. Work on a separate sheet of paper. Show all work. Leave you answer in simplest fraction form, if necessary. Important: When no base is shown, the base is 10.

14. $\log_6(2x-3) = \log_6 12 - \log_6 3$
15. $\log(x+2) - \log x = 2\log 4$
16. $3\log_2 x - 2\log_2(5x) = 2$
17. $2\log_4(x+1) = \log_4(11-x)$
18. $\log x + \log(3x-5) = \log 2$
19. $\log(-4-x) + \log 3 = \log(2-x)$
20. $\log x - \log(x+6) = \frac{1}{2}\log 9$
21. $\log_2(x+7) + \log_2 x = 3$
22. $\log_3(x+3) + \log_3(x+5) = 1$
23. $\log(x+3) = 1 + \log(x-2)$
24. $\log(57x) = 2 + \log(x-2)$
25. $\log_5(x+3) - \log_5(2x-1) = 2$
26. $\log_2(5y+2) - 1 = \log_2(1-2y)$
27. $\log(c^2-1) - 2 = \log(c+1)$
28. $\log_7 x + 2\log_7 x - \log_7 3 = \log_7 72$
29. $\log_{16}(9x+5) - \log_{16}(x^2-1) = \frac{1}{2}$
30. $3\log_5(x^2+9) - 6 = 0$

Part 4: Trigonometry, Law of Sines and Law of Cosines

Right Triangle Trigonometry: Find the values of sine, cosine and tangent of for θ. Write your answer in simplest fraction and/or radical form (rationalize your denominator!!)

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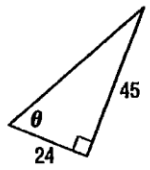

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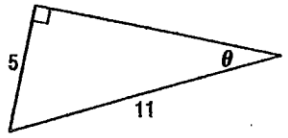

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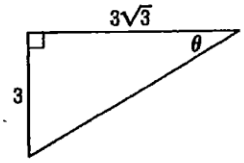
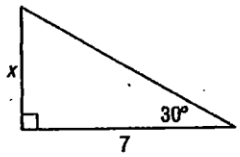


Write an equation involving sine, cosine or tangent that can be used to find x. Then solve the equation.

Round measures of sides to the nearest tenth and measures of angles to the nearest degree.

4.



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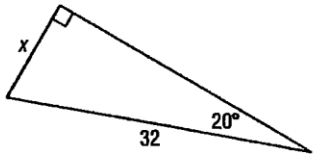

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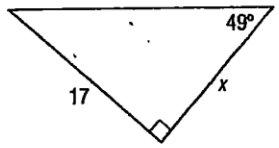

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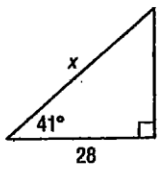

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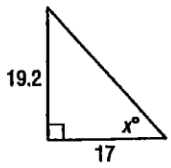

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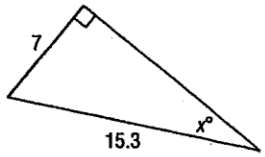
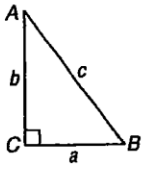


Solve for all missing parts of triangle ABC using the given measurements. Round measures of the sides to the nearest tenth and measures of the angles to the nearest degree.

10. A = 35°, a = 12
11. B = 71°, b = 25
12. B = 36°, c = 8
13. a = 4, b = 7
14. A = 17°, c = 3.2
15. b = 52, c = 95



Use Trigonometry, Law of Sines, or Law of Cosines to solve each triangle. Round to the nearest tenth.

16. B = 70°, C = 58°, a = 84
17. c = 8, C = 49°, B = 57°
18. A = 51°, b = 40, c = 45
19. B = 19°, a = 51, c = 61
20. B = 42°, C = 90°, c = 15
21. a = 2, b = 7, c = 8
22. a = 7, b = 9, B = 70°
23. b = 12, c = 20, A = 40°